## WHAT IS CLAIMED IS;

1	1. A method for the formation of rectifying junctions on alloy-semiconductors
2	comprising the steps of:
3	photo-electrochemical removal of one component of the alloy material and
4	chemical etching of another component of the alloy
5	to produce a positive-intermediate-negative (PIN) structure semiconductor.
1	2. The method according to Claim 1, wherein the alloy semiconductor comprises
2	a combination of Group II element and a Group VI element.
1	3. The method according to Claim 2, wherein the alloy semiconductor comprises
2	CdTe.
1	4. The method according to Claim 2, wherein the alloy semiconductor comprises
2	CdZnTe.
1	5. The method according to Claim 2, wherein the alloy semiconductor comprises
2	HgZnCdTe.
1	6. The method according to Claim 2, wherein the alloy semiconductor comprises
2	HgCdZnSe.
1	7. A method for the formation of rectifying junctions on alloy-semiconductors
2	comprising the steps of:
3	photo-electrochemical removal of one component of the alloy material to produce one
4	portion of the junction and
5	deposition of a second component to produce a second portion of the junction
6	to produce a positive-intermediate-negative (PIN) structure semiconductor

- 1 8. The method according to Claim 7, wherein the alloy semiconductor comprises
- 2 a combination of Group II element and a Group VI element.
- 1 9. The method according to Claim 8, wherein the alloy semiconductor comprises
- 2 CdTe.
- 1 10. The method according to Claim 8, wherein the alloy semiconductor comprises
- 2 CdZnTe.
- 1 11. The method according to Claim 8, wherein the alloy semiconductor comprises
- 2 HgZnCdTe.
- 1 12. The method according to Claim 8, wherein the alloy semiconductor comprises
- 2 HgCdZnSe.
- 1 13. A positive-intermediate-negative (PIN) structure semiconductor constructed
- 2 by the process consisting of the steps of:
- 3 photo-electrochemical removal of one component of the alloy material and
- 4 chemical etching of another component of the alloy
- 5 to produce the positive-intermediate-negative (PIN) structure semiconductor.
- 1 14. The PIN structure semiconductor according to Claim 13, wherein the alloy
- 2 semiconductor comprises a combination of Group II element and a Group VI element.
- 1 15. The PIN structure semiconductor according to Claim 14, wherein the alloy
- 2 semiconductor comprises CdTe.
- 1 16. The PIN structure semiconductor according to Claim 14, wherein the alloy
- 2 semiconductor comprises CdZnTe.
- 1 The PIN structure semiconductor according to Claim 14, wherein the alloy
- 2 semiconductor comprises HgZnCdTe.

- 1 18. The PIN structure semiconductor according to Claim 14, wherein the alloy semiconductor comprises HgCdZnSe.
- 1 19. A device for detecting and measuring an electrical response due to a single
- 2 charge carrier in a room-temperature semiconductor, the device comprising:
- a PIN structure semiconductor, said semiconductor having first and second ends;
- a first electrode in electrical contact with said first end, said first electrode biased at a
- 5 first electrical potential;
- a second electrode in electrical contact with said second end, said second electrode
- 7 biased at a second electrical potential, said first potential greater than said second potential;
- 8 wherein the PIN structure semiconductor is constructed by the process consisting of
- 9 the steps of:
- photo-electrochemical removal of one component of the alloy material and
- chemical etching of another component of the alloy
- to produce the PIN structure semiconductor.
- 1 20. The device according to Claim 19, wherein the alloy semiconductor comprises
- 2 a combination of Group II element and a Group VI element.
- 1 21. The device according to Claim 20, wherein the alloy semiconductor comprises
- 2 CdTe.
- 1 22. The device according to Claim 20, wherein the alloy semiconductor comprises
- 2 CdZnTe.
- 1 23. The device according to Claim 20, wherein the alloy semiconductor comprises
- 2 HgZnCdTe.

- 1 24. The device according to Claim 20, wherein the alloy semiconductor comprises
- 2 HgCdZnSe.

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